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09/528,766	03/17/2000	Martin L. Radue	OMCO:0056	5306

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EXAMINER

SOLAK, TIMOTHY P

ART UNIT PAPER NUMBER

3746

DATE MAILED: 11/24/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/528,766

Applicant(s)

RADUE, MARTIN L.

Examiner

Timothy P. Solak

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 20
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Status*

The status of the claims in the application cited above is as follows:

- ⌘ Claim 18 has been canceled.
- ⌘ Claims 1-17 and 19-24 are pending.

### *Claim Objections*

The change, made in the amendment received on 09/02/2003 to Claims 16 and 17, limiting "the permanent magnet" to "the pair of permanent magnets" has overcome the objections set forth in the previous office action.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gully et al. (5,032,772). Gully et al. teach a reciprocating pump comprising: a housing assembly 3 including a drive section 18, a pump section 10 (see Figure 1) and a drive assembly 16/17 disposed in the drive section. Gully et al. further teach said drive assembly includes a permanent magnet 17a and a coil assembly 20 having windings (an essential element of a coil); said coil

disposed within a central volume of the drive section adjacent to the permanent magnet (see Figure 1A) and movable reciprocally axially along a central axis (column 1, line 66 to column 2, line 1). Gully et al. further disclose a pumping member 12 secured to and movable reciprocally with the coil assembly, the pump member extending into the pump section to produce pressure variations in the pump section during reciprocal movement to draw fluid into the pump section and to express fuel therefrom (column 3, lines 51-54). Gully et al. specifically teach controlling the length of the piston stroke and hence the volume rate of the pump output by varying the amplitude of an alternating polarity input signal (column 3, lines 55-60).

With respect to the "imparting force" limitations, Gully et al. teach varying the amplitude controlled the length of the piston stroke and the volume rate of the pump. It was old and well known in the art of pump fabrication that the force of a reciprocation piston pump is a function of the piston position and flow rate of the pump. Such relationships are governed by the laws of physics and can be interchanged through simple mathematical formulas. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used terms of force, in the pump disclosed by Gully et al., to have advantageously facilitated calculations.

With respect to the "pressure variations in pump output", Gully et al. teach varying the amplitude controlled the length of the piston stroke and the volume rate of the pump output. It was old and well known in the art of pump fabrication that "pressure variations in pump output" is a function of the volume rate of the pump out. Such relationships are governed by the laws of physics and can be interchanged through simple mathematical formulas. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have

used terms of pressure, in the pump disclosed by Gully et al., to have advantageously facilitated calculations.

With respect to the intended use of the apparatus, namely pumping fuel, the prior art teaches all of the structural limitations set forth in the claims and is therefore capable of performing all the possible uses of such a structure. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have pumped fuel in the pump disclosed by Gully et al., to have advantageously increased the utility of the unit.

Claim 2-3, 5-7, 9-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gully et al. (mentioned previously), in view of Waring (4,940,035). Although Gully et al. teach most of the limitations of the claims, including a reciprocating pump with a permanent magnet and a coil driven by alternating polarity signals of variable amplitude, he does not disclose specifics of the structure of the assembly, such as a magnet surrounding the coil, a tubular member, check valves or a nozzle. Waring, disclosing a reciprocating fuel pump (column 3, lines 45-47), specifically teaches a housing assembly 21/8 including a drive section 21, a pump section 8 (see Figure 2) and a drive assembly 19/20/21 disposed in the drive section (see Figure 3). Waring further teaches the drive assembly includes a permanent magnet 21 (column 4, lines 2-3) and a coil assembly 20 having windings (column 4, lines 5-6) and disposed within a central volume of the drive section adjacent to the permanent magnet and movable reciprocally axially along a central axis. Waring further teaches a pumping member 19/17 secured to and movable reciprocally with the coil assembly, the pump member extending into the

pump section to produce pressure variations in the pump section during reciprocal movement to draw fuel into the pump section and to express fuel therefrom (column 4, lines 40-45).

Waring further teaches the permanent magnet at least partially surrounds a portion of the central volume (inside portion of 21) and extends generally along a central axis (axis of 17, see Figure 3), wherein the coil assembly is disposed radially within the portion of the central volume. Waring discloses the permanent magnet is disposed adjacent to an end of the drive section, wherein the coil assembly is disposed between the permanent magnet and the pump section (see Figure 3). Waring discloses the permanent magnet includes at least one magnet element (top portion of 21 protruding into the central volume). Waring further discloses an inlet 37 and an outlet 30 check valve, both valves being actuated by pressure variations produced by reciprocal movement of the pump member in the pump section (column 6, lines 34-35 and 51-56). Waring discloses a nozzle 14 in fluid communication with the pump section for expressing pressurized fuel from the pump section (column 6, lines 25-26). Waring teaches the pump structure advantageously reduced manufacturing costs (column 2, lines 28-30). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used the magnet surrounding the coil, the tubular member, check valves and nozzle taught by Waring, in the pump disclosed by Gully et al., to have advantageously reduced manufacturing costs.

With respect to Claim 5 and 12, although combination of prior art teaches most of the limitations of the claims, including a tubular pump member 17/19 (column 4, lines 1-5) extending from a coil assembly 20 through a bore 16 into a pump section 8, it does not explicitly disclose a seal. It was old and well known in the art of pump fabrication that an ordinary seal

between a pump's piston and a pump's cylinder advantageously increased the efficiency of the unit by preventing blow-by and leakage. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used an ordinary seal, in the pump disclosed by Waring, to have advantageously increased the efficiency of the unit.

Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gully et al. (mentioned previously), in view of Karsten et al. (5,334,910). Gully et al. teach a reciprocating pump comprising: a housing assembly 3 including a drive section 18, a pump section 10 (see Figure 1) and a drive assembly 16/17 disposed in the drive section. Gully et al. further teach said drive assembly includes a permanent magnet 17a and a coil assembly 20 having windings (an essential element of a coil); said coil disposed within a central volume of the drive section adjacent to the permanent magnet (see Figure 1A) and movable reciprocally axially along a central axis (column 1, line 66 to column 2, line 1). Gully et al. further disclose a pumping member 12 secured to and movable reciprocally with the coil assembly, the pump member extending into the pump section to produce pressure variations in the pump section during reciprocal movement to draw fluid into the pump section and to express fuel therefrom (column 3, lines 51-54). Gully et al. specifically teach controlling the length of the piston stroke and hence the volume rate of the pump output by varying the amplitude of an alternating polarity input signal (column 3, lines 55-60). Although Gully et al. teach most of the limitations of the claim, including a permanent magnet, he does not disclose a pair of magnets. The unity or diversity of parts depends on the choice of manufacturer and the convenience and availability of the machines and tools necessary to construct the pump. Lacking any limitations prohibiting the

use of a single magnet (such as locations of each magnet in the pair), it would have been obvious to one of ordinary skill in the art of pump fabrication to use two smaller magnets to accomplish the same effect. Karsten et al., disclosing a tube surrounded by a permanent magnet, specifically teach a pair of permanent magnets 50/52. Karsten et al. teach the pair of magnets advantageously facilitated assembly of the unit (column 2, lines 5-9). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used the magnetic pair taught by Karsten et al., in the pump disclosed by Gully et al., to have advantageously facilitated assembly of the unit.

Claims 16-17 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gully et al., in view of Karsten et al., in further view of Waring (all mentioned previously). Although Gully et al. teach most of the limitations of the claims, including a reciprocating pump with a permanent magnet and a coil driven by alternating polarity signals of variable amplitude, he does not disclose specifics of the structure of the assembly, such as a magnet surrounding the coil, a tubular member, check valves or a nozzle. Waring, disclosing a reciprocating fuel pump (column 3, lines 45-47), specifically teaches a housing assembly 21/8 including a drive section 21, a pump section 8 (see Figure 2) and a drive assembly 19/20/21 disposed in the drive section (see Figure 3). Waring further teaches the drive assembly includes a permanent magnet 21 (column 4, lines 2-3) and a coil assembly 20 having windings (column 4, lines 5-6) and disposed within a central volume of the drive section adjacent to the permanent magnet and movable reciprocally axially along a central axis. Waring further teaches a pumping member 19/17 secured to and movable reciprocally with the coil assembly, the pump member extending into the



pump section to produce pressure variations in the pump section during reciprocal movement to draw fuel into the pump section and to express fuel therefrom (column 4, lines 40-45).

Waring further teaches the permanent magnet at least partially surrounds a portion of the central volume (inside portion of 21) and extends generally along a central axis (axis of 17, see Figure 3), wherein the coil assembly is disposed radially within the portion of the central volume. Waring discloses the permanent magnet is disposed adjacent to an end of the drive section, wherein the coil assembly is disposed between the permanent magnet and the pump section (see Figure 3). Waring discloses the permanent magnet includes at least one magnet element (top portion of 21 protruding into the central volume). Waring further discloses an inlet 37 and an outlet 30 check valve, both valves being actuated by pressure variations produced by reciprocal movement of the pump member in the pump section (column 6, lines 34-35 and 51-56). Waring discloses a nozzle 14 in fluid communication with the pump section for expressing pressurized fuel from the pump section (column 6, lines 25-26). Waring teaches the pump structure advantageously reduced manufacturing costs (column 2, lines 28-30). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used the magnet surrounding the coil, the tubular member, check valves and nozzle taught by Waring, in the pump disclosed by Gully et al., to have advantageously reduced manufacturing costs.

With respect to Claim 19, although combination of prior art teaches most of the limitations of the claims, including a tubular pump member 17/19 (column 4, lines 1-5) extending from a coil assembly 20 through a bore 16 into a pump section 8, it does not explicitly disclose a seal. It was old and well known in the art of pump fabrication that an ordinary seal

between a pump's piston and a pump's cylinder advantageously increased the efficiency of the unit by preventing blow-by and leakage. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used an ordinary seal, in the pump disclosed by Waring, to have advantageously increased the efficiency of the unit.

### ***Response to Arguments***

Applicant's arguments, received on 09/02/2003, have been considered but are moot in view of the new ground(s) of rejection.

The Examiner, first became aware of the new grounds for rejection, namely Gully et al. (column 1, line 65 to column 2, line 1), on 11/08/2003.

The following comments are in response to the arguments submitted on 09/02/2003:

With respect to the Gully et al./ Waring combination, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

One of ordinary skill in the art of pump fabrication, is well advised of the potential of an arbitrarily disclosed, pump and motor combination; namely the teachings of the pump can standalone or be sued in combination with other motors. Likewise, the teaching motor can be

used to drive another apparatus such as a fan. Obviousness does not require a photocopy replication but instead, is inclusive of the suggested teachings. In this instance, Waring teaches a fuel system comprising two fuel pumps. One of ordinary skill is well advise of the advantages and uses of the individual pumps disclosed by Waring. Only a minimum level of skill is required to extrapolate a single pump from the disclosed unit and such a modification would not alter the function of the pump, namely moving fluid.

With respect to a change in the "principle of operation" of the Gully et al./ Waring combination, the principle of operation of both Gully et al. and Waring is Faraday's law. Both Gully et al. and Waring disclose reciprocating piston pumps, both driven by a current flow through a coil. Combining the structure of Waring into Gully et al. will not alter the principle of operation because the reciprocating movement of the pump is still driven by a current flow through a coil.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Tsukahara (5,064,353) teaches a pump with a moving coil energized by alternating polarity (Claim 1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy P. Solak whose telephone number is 703-308-6197. The examiner can normally be reached on Monday through Friday from 10am to 6pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu can be reached on 703-308-2675. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.

  
JUSTINE R. YU  
PRIMARY EXAMINER

11/14/03

  
tps

November 10, 2003